

Andrews (E.)

# COMPLETE RECORD

OF THE

# SURGERY OF THE BATTLES

FOUGHT NEAR VICKSBURG,

DECEMBER 27, 28, 29, & 30, 1862.

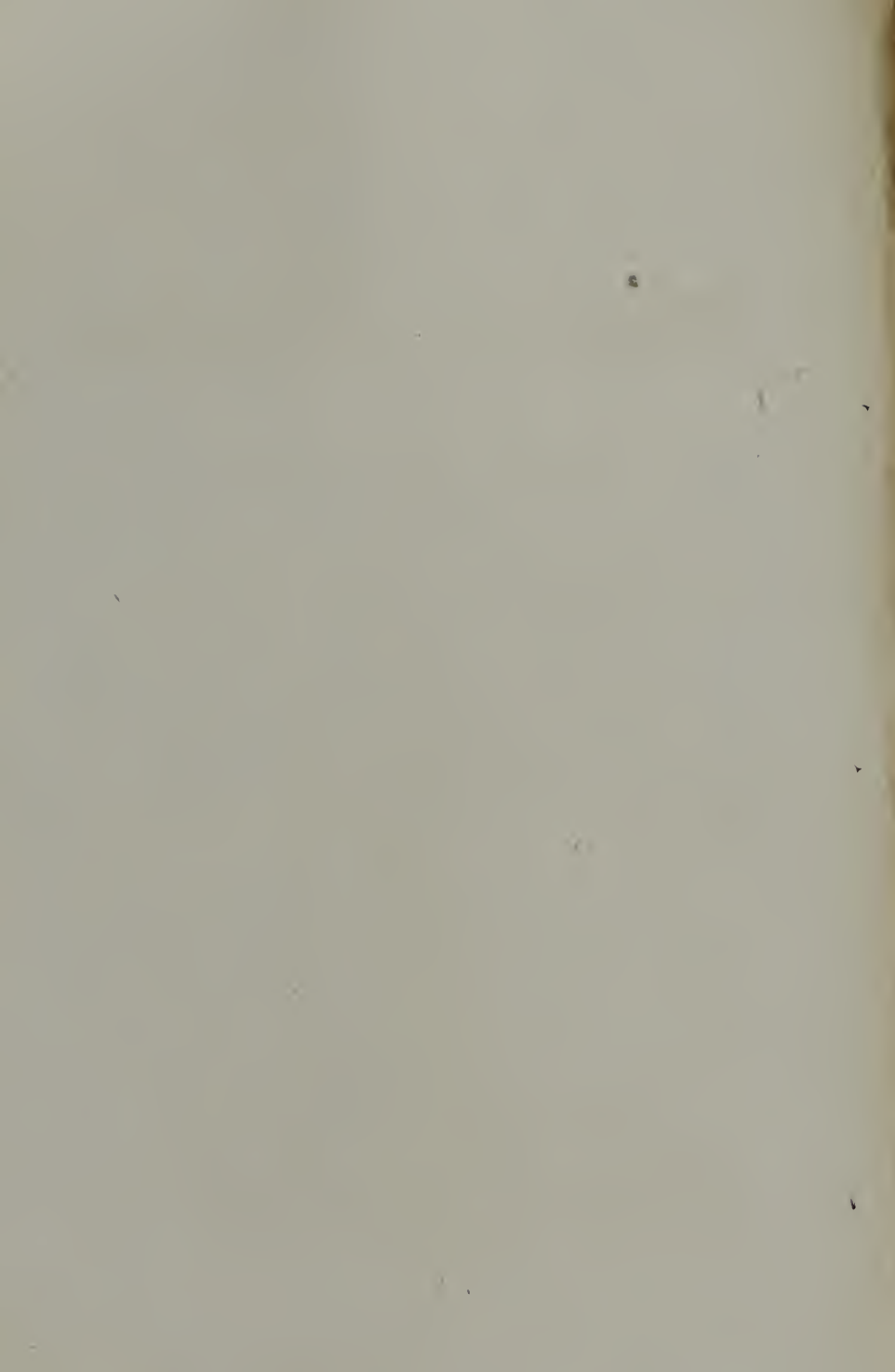
BY E. ANDREWS,

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CHICAGO:

GEORGE H. FERGUS, BOOK AND JOB PRINTER,  
No. 179 STATE STREET.

1863.



# COMPLETE RECORD OF THE SURGERY OF THE BATTLES FOUGHT NEAR VICKSBURG, DEC.

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By E. ANDREWS, late Surgeon of 1st Reg. Ill. Light Artillery, and Professor of Surgery in the Medical Department of Lind University.

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A complete record of the surgery of any battle during the present war, is a thing which, heretofore, has seldom been attempted.

Both in the east and the west, the urgency of military movements, and the confusion of battle, have made futile the imperfect attempts at registration adopted, and the vast statistics of the war have slipped forever from our hands.

In the west, the wounded have usually been taken from the Field Hospitals to the Hospital Boats, and by them taken on long river voyages to General Hospitals in our cities. The operations and deaths were not communicated by the field-surgeons to the surgeons of the boats, and the surgery and mortality on the boats were not faithfully furnished to the General Hospitals. The statistics of the Field, the Boats, and the General Hospitals, therefore, are not combined, and no continuous history of the cases can be traced. In this, and in similar ways, have the enormous statistics of almost all our great battles been lost to the profession, and the vast and costly experience of so much blood and death been rendered worthless

for the settlement of the many difficult questions in practical surgery.

It was with intense chagrin that I thus saw the entire loss of scientific results from the bloody battles of Fort Donelson, Shiloh, and the numerous lesser combats in front of Corinth. It is a painful fact, that after these battles the results of the various operations and injuries remained entirely unknown to the original operators, and they gained almost nothing by their experience, except the skill of hand acquired in their manipulations.

For this reason, I resolved at the next large battle in which I should be engaged, to make a determined effort to secure the entire surgical history of the wounded up to the latest period which the circumstances would permit. In this endeavor I have been successful. Owing to the judicious orders of Medical Director, Dr. CHARLES McMILLAN, the field records were measurably well kept, and by the help of Dr. H. B. WITT, senior assistant-surgeon of the 69th Indiana Infantry, who entered into my plans with great energy, I have been put in possession of the subsequent history of the cases, for the most part, up to the twentieth day after the battle.

Dr. WITT was with the wounded personally up to that time, and displayed great skill and capacity in his operations and management.

I am also indebted to the assistance of Dr. TURNER, the well-known surgeon of the hospital steamer "City of Memphis," for valuable information in completing the record.

The following order will show the arrangements adopted to secure order and efficiency on the field:—

#### CIRCULAR.

HEAD-QUARTERS RIGHT WING 13TH ARMY CORPS,  
ON BOARD STEAMER "FOREST QUEEN,"  
*December 20th, 1862.*

To the end that the Medical Staff of this command may act with the greatest possible efficiency, in the necessary and proper care and treatment of the wounded on the battle field, the fol-

lowing instructions are issued for the guidance of Regimental and Division-Surgeons:—

The present organization of the division gives but one principal medical officer, who is attached to the staff of the general commanding, and upon whom devolves the administrative duties. All other surgeons are relieved from duty with brigades, and will, therefore, be charged only with the care of their own regiments.

Before a battle, the senior surgeons of divisions will select a proper and convenient place to serve as a principal depot and field-hospital; notifying the surgeons of his division and the medical director of its location; and will make such arrangements as shall secure the prompt delivery, by the litter-bearers and ambulances of his division, of the wounded of the command, in order that they may receive immediate attention.

To secure the prompt delivery at the depot, and the immediate necessary attention, the hospital service will be systematized as follows:—

Division-surgeons will direct all ambulances belonging to the division to report to them at once, so soon as an action is deemed imminent, and will proceed to fit up their depot, asking for that service, for a sufficient detail under the charge of a competent lieutenant from the division commander. This detail should be made from the regiments, and should be large enough to furnish two men to each ambulance, in addition to the driver, who should not leave his team. These should not be boys and worthless old men; but strong, brave, and efficient ones. They will be distinguished by a strip of white bandage tied around the arm above the elbow; and no others shall be permitted to leave the ranks and carry wounded to the rear. The bands will assist in pitching tents and preparing shelter, and fuel, fires, and nourishment for the wounded. And these, with the above-mentioned detail, shall be placed under the charge of an assistant-surgeon, who shall be selected for the superintendence of this department of hospital duty.

Furthermore, the Hospital shall be organized as follows:—

Three principal operators shall be selected from the Medical

Staff of the Division-Surgeon; and they, under the direction of this senior medical officer, shall decide upon and perform all principal operations. They will be selected without reference to rank, but solely for the requisite qualifications and experience. Each operator shall have one assistant, to be selected in the same manner. One efficient assistant shall be selected to keep the records of the depot, and another to attend as above mentioned, to the providing of food, shelter, &c. It is understood that one assistant-surgeon with his hospital steward and attendants, shall accompany the regiment to which he is attached to the field, and select and station himself at a convenient and safe place in the rear, to which the wounded may be first brought from the ranks, where temporary dressings may be applied, and where the ambulances may collect them for transmission to the hospital or principal depot. He should be relieved, if the action continues, by another, that justice be done to all and each. All the medical officers should immediately report at the principal depot of their division, and assist in the general care of the wounded.

The division trains being usually posted in a secure place, and at generally too great a distance to make resort to the regimental medical stores in the wagons available; the medicine wagons, pannier sets, and hospital knapsacks, should be reserved with the ambulances before the commencement of an action, from the Quarter-Master's train, and used for the occasion as necessity may require. The knapsacks, as above mentioned, and the medicine wagons and pannier sets, with the proper proportion of instruments to be placed under the orders of the surgeon in charge at the principal depot. Care should be taken that the supplies of chloroform, ether, and stimulants are present and available.

Beef should be obtained at once, and with the stores of farina, tea, &c., the wounded can at once be nourished and made comfortable. Such cooks as shall be selected, shall be ordered to the principal depot; and such attendants as are not needed by the surgeon in the field, will assist in the care and nursing of the wounded.

Prompt and careful compliance with these instructions, it is hoped, will secure to our brave officers and soldiers who may be wounded in the battles which may follow, such care and treatment as they nobly deserve; and such as their much sacrificing friends at home have just right to expect.

(Signed.) CHAS. McMILLAN,  
Medical Director, Right Wing 13th Army Corps.

By this arrangement it will be seen that one assistant-surgeon accompanied each regiment under fire, to attend to such injuries as might require instantaneous attention. The wounded were thence taken to division depots about 200 yards from the line of battle, for full examination, and at these depots all principal operations were attended to. Three surgeons were appointed operators in each division, and by them all serious operations were performed. One assistant-surgeon was appointed at each depot to make record of the name, company, regiment, injury, operation, and name of the operator of each patient brought in.

Being appointed one of the operators, I had opportunity to know that the recorder of my division, (Dr. BROWN, 113th Ill. Infantry,) was very careful and thorough in his notes, and I now have his original field-registar before me for my guidance. The following order shows the arrangements adopted in the 2d division, which was substantially like those in the others:—

#### CIRCULAR.

HEAD-QUARTERS 2d DIVISION, RIGHT WING 13th ARMY CORPS,  
ON BOARD STEAMER "CHANCELLOR,"  
*December 25th, 1862.*

In accordance with Circular bearing date December 20th, 1862, the following named medical officers have been selected, and will act in the particular position here assigned to them in case of a battle. The following named medical officers are selected as principal operators at division hospital:—

E. Andrews, Surgeon,	.	1st Ill. Light Artillery.
E. O. F. Roler, "	.	54th " Infantry.
G. S. Walker, "	.	6th Mo. "

For assistants to same:—

D. W. Carlin, Surgeon,	57th Ohio.
J. R. Bailey, “	8th Mo.
C. P. Brent, “	54th Ohio.

Recorder for Division Hospital:—

L. C. Brown, 1st Assistant-Surgeon, 113th Ill.

To take charge bands, cooks, &c., for preparing food, shelter, and fuel at division hospital:—

H. C. Vinsen, 2d Assistant-Surgeon, 83d Ind.

The following Medical Officers will report at division hospital for duty:—

I. N. Heckalman, 1st Assistant,	116th Ill.
L. Davis, Surgeon,	83d Ind.
J. R. Gore, “	127th Ill.
Wm. Turner, Assistant-Surgeon,	1st Ill. Artillery.
James M. Mack, Surgeon,	113th Ill.

The following named Medical Officers will accompany their regiments into action, each having under his charge the hospital stewards and all other hospital attendants, except these that may be detailed for duty at the division hospital. The hospital steward will carry the knapsack filled with such articles as may be necessary for immediate use. Medical officers will give their personal attention, and see that their medical supplies are at division hospital:—

E. M. Joslin, 1st Assistant-Surgeon,	6th Mo.
Ivlus Brown, “	8th “
J. Baygo, . . . . .	54th Ohio.
S. L. Harper, . . . . .	55th Ill.
A. C. Messenger, . . . . .	57th Ohio.
W. Gillispi, . . . . .	83d Ind.
W. N. Bailey, . . . . .	113th Ill.
J. A. W. Hartiller, . . . . .	116th Ill.
G. P. Anthony, . . . . .	127th “
I. Huss, . . . . .	13th U. S. A.

D. W. HARTSHORN,  
Medical Director, 2d Division,



The ambulances were worked in two sections: one portion bringing the wounded from the front to the depot, and the other taking them away, after the wounds were dressed, to the hospital boats.

In this way the wounded were all attended to without confusion, and most of the time without haste, and with few exceptions, the injured of each day were safely lodged on the hospital boats the same night. I must do the operators also the justice to say that they performed their duty well, avoiding with good judgment the two extremes of reckless slashing and dangerous ultra conservatism. A few of the assistant-surgeons who were sent under fire, became so exhilarated at the music of the bullets, as to expose themselves to an unnecessary amount of danger, but not a man of them proved cowardly.

After the battle, the fleet left for the mouth of White River, Arkansas; and from thence the wounded were taken to Memphis, afterwards to St. Louis. In all these movements about twenty days were consumed, which is sufficient to show the probable results of the operations. My record closes in most cases with the nineteenth and twentieth days after the battle, when the cases were turned over to General Hospital in St. Louis. The following table contains the particular cases and results, and therefore, are the basis and proof of the remarks, and conclusions following them; and it is peculiarly gratifying to me that at length we are able to bring the maxims of military surgery to the corrective test of a large collection of facts, obtained on the western fields:—

Tabular View of the Wounds and Surgical Operations of the late Battles near Vicksburg, on the 27th, 28th, and 29th of December, 1862, with Addenda from other Western Battles.

WOUNDS OF THE HEAD.

Case.	Name.	Regiment.	Injury.	Operation.	Anes- thetic.	REMARKS.
1	N. A.	49 Indiana	Shot in mouth	Ball not extracted	None	Very weak 15th day
2	G. B.	16 Ohio	Shell wound of back of head, right side	None		Left leg paralyzed
3	S. M.	54 Indiana	Shell wound, left eye and temple	"		Had erysipelas,—better Doing well 15th day
4	J. H.	6 Missouri	Eye injured	"		do
5	S. B. M.	54 Indiana	Severe scalp wound, right side	"		Worse 16th day
6	W. J.	16 Ohio	Scalp wound, left side head	"		Doing well 16th day
7	A. H.	6 Missouri	do top of head	"		do
8	H. C.	83 Indiana	do back of head	"		do
9	J. S.	4 Iowa	Bullet entered left side of mouth	Bullet not found		do
10	J. R.	6 Missouri	Scalp wound, top of head	None		do
11	W. F.	42 Ohio	Shell wound of forehead	"		do 17th day
12	J. W.	do	Contusion of temple	"		do
13	W. W. F.	54 Indiana	Bullet enter'd below right ear, passed out back of neck	"		do
14	W. W. R.	16 Ohio	Bullet pierced nose, shattered palate bone, and passed into region of fauces	Bullet extracted		do 18th day
15	S. R.	do	Scalp wound, top of head	None		Erysipelas, doing well 18th
16	G. V. S.	54 Indiana	Ball enter'd mouth, knock'd in front teeth	Bullet not extracted		Secondary hemorrhage 11th day. Cleek'd with persulph.
17	A. D.	do	General concussion by shell	None		iron; doing well 17th day
18	T. B.	29 Missouri	Shell wound, destroyed right eye	"		Doing poorly 17th day
19	W. B. A.	30 Iowa	Shell wound, side of head	"		Doing well 18th day
20	A. W. B.	4 do	Ball entered mouth, passed out under left ear	"		Not doing well 18th day Doing well 18th day

Case	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
21	E. A. G.	57 Ohio	Shell wound, right temple	None		Doing well 20th day
22	M. B.	114 do	Compound fracture of skull	"		Died 12th day
23	J. H. E.	54 Indiana	Shot in face	"		do 7th day
24	McE. K.	49 do	do cranium	"		do 1st do
25	J. H.	16 Ohio	do do	"		do do
26	E. S.	do	Wound of ear	"		do 13th day
27	P. S.	83 Indiana	Comp. fracture frontal bone, dura mater not opened	Removed loose fragm'ts bone	None	
28	J. H.	do		None		
29	W. W.	6 Missouri	Shell wound, right temple	"		
30	W. McK.	54 Ohio	Bullet entered brain through right eye	"		
31	J. S.	13 Regulars	Scalp wound	"		
32	M. A.	6 Missouri	Compound fracture of lower jaw	"		
33	G. C.	16 Ohio	Slight scalp wound	"		Returned to duty
34	S. W.	do	do wound of cheek	"		Doing well 10th day
35	C. W. J.	54 Indiana	do do	"		do do
36	P. B.	do	Scalp wound	"		do 8th day
<i>Addenda from notes of other Western Battles.</i>						
37	J. J.	8 Iowa	Comp. fr. of skull. Deep depression; compression of brain	Trepanned 9th day	None	Had erysipelas; died 10th day
38	F. A.	17 Illinois	Shot in sup. max. bone	None		Exfoliation of bone, recover'd
39	B. C.	6 Ill. Cav.	6 buck-shot in face, one penetrating brain	"		Died 5th day

To the above should be added eleven slightly wounded cases, who were returned to their Regiments.

Total, 50.

## WOUNDS OF THE NECK, TRUNK, AND SHOULDER.

1	C. S.	22 K'tucky	Flesh wound, abdominal wall	None	Doing well 20th day
2	J. H. D.	do	Upper lobe of left lung	"	do
3	C. M.	16 Ohio	Shot thro' breast, above and internal to nipple, ball came out the back	"	do
4	J. D. H.	do	Flesh wound of shoulder	"	Doing badly 15th day
5	S. S.	49 Indiana	do	"	Very weak do
6	B. F. M.	do	Bullet through left chest	"	Doing well do
7	T. W. S.	16 Ohio	do left lung, air escaped	"	do
8	H. A. D.	114 Ohio	Shell wound of back	Ball cut out below scapula	Parts below paralyzed
9	J. P. L.	54 Indiana	do and hip	None	Doing toler'y well 15th day
10	J. H. H.	do	do left side of neck	"	Doing well 16th day
11	A. B.	16 Ohio	Ball entered left side of neck, below ear, and escaped over rt scapula	"	Doing toler'y well 15th day
12	G. S.	42 do	Shell wound of back	"	Doing well 15th day
13	J. E.	29 Missouri	Ball passed thro' right chest and arm	"	do
14	D. P. V.	54 Indiana	Flesh wound left side of neck	Ball not extracted	Doing toler'y well 15th day
15	B. F. S.	13 Illinois	do shoulder	None	No better 16th day
16	W. S.	42 Ohio	Contusion of back	"	Pain in breast 16th day
17	H. S.	54 Indiana	do breast by shell	"	Doing well 16th day
18	G. S.	31 Missouri	Flesh wound, left shoulder	"	Doing badly do
19	R. D.	16 Ohio	Wound, penetrating left side	"	Doing well do
20	H. M.	49 Indiana	Flesh wound, shoulder	"	do
21	A. B.	do	do side of neck	"	do
22	G. C.	22 K'tucky	do right shoulder	"	do
23	J. W.	25 Iowa	Bayonet wound of shoulder	"	do
24	H. L.	22 K'tucky	Ball passed across front of neck, anterior to arteries	"	do
25	R. V. L.	16 Ohio	Flesh wound, ball glided around on rib of left side, beneath the skin	"	do 17th day
26	M. B.	7 Mich. Bat.	Flesh wound of back, over 6th rib	Bullet cut out	do
27	J. McD.	do	do abdomen, by cannister, not penetrating cavity	Iron shot cut out on 9th day	do
28	C. W. H.	31 Missouri	Flesh wound, right shoulder	None	do

Name.	Regiment.	Injury.	Operation	Anes- thetic.	Remarks.
29 H. S.	29 Missouri	Flesh wound, right shoulder	None		Doing well 18th day
30 A. Y.	28 Ia.	Bullet entered near shoulder	Cut out near spine		Erysipelas on 17th day
31 J. P.	13 Missouri	Right lung penetrated	None		Doing well 20th day
32 R. W.	4 Iowa	Flesh wound, left side	Ball cut out from back		do 18th day
33 J. M.	6 Missouri	do both shoulders	None		do
34 S. C.	13 do	do right shoulder	Ball extracted		do
35 H. R.	6 do	do right breast	" at left scapula		Not doing well 18th day
36 O. C.	29 do	do right breast	None	None	Doing well 18th day
37 J. J.	54 Ohio	do lung	"		do
38 F. T.	29 Missouri	do lower end of spine	"		do
39 J. E.	do	Flesh wound, left shoulder	"		do
40 C. G.	13 Illinois	Ball entered near shoulder and passed out by 12th rib	"		do
41 O. P. W.	do	Shot through right upper lung	"		do
42 J. S.	do	Fracture of right shoulder	"		do
43 H. G.	do	Ball entered near scapula	Ball cut out		do
44 F. Z.	31 Missouri	Flesh wound, trunk	None		Not doing well 18th day
45 M. M.	6 do	do	"		Doing well 18th day
46 A. D. W.	13 Illinois	Flesh wound, back	"		do
47 S. A. D.	4 Iowa	do left shoulder	"		do 20th day
48 M. C.	13 Regulars	do back	Ball extracted	None	do
49 F. L. M.	4 Iowa	do side and hip	None		do
50 F. S.	6 Missouri	do side and back	"		do
51 E. E. A.	31 do	do neck and shoulder	"		do
52 W. F. C.	55 Illinois	do shoulder	"		do
53 A. B. C.	42 Ohio	Shot in left shoulder	"		Died 7th day
54 J. K.	54 Indiana	do head, breast, and leg	"		do 1st day
55 G. H.	16 Ohio	Flesh wound, right shoulder	"		Rebel, died 12th day of pneu.
56 C. F.	28 Ia.	Shot through right breast	"		Died 7th day
57 W. R.	49 Indiana	Penetrating wound in side	"		do 6th day
58 A. W. C.	42 Ohio	do breast	"		do 1st day
59 B. B. D.	40 Indiana	do abdomen	"		

60	W. M.	1 Wis. Bat.	Penetrating wound in abdomen	"	"	do
61	J. C. H.	22 K'tucky	Body and arm	"	"	do 12th day
62	M. R.	54 Indiana	Right lung shot through	"	"	do 8th day
63	C. B.	13 Illinois	Shot in the right lung	"	"	do 6th day
64	J. T.	22 K'tucky	Ball entered chest, through left shoulder	"	"	do
65	P. W. E.	16 Ohio	Ball entered side, through arm	"	"	do 12th day
66	A. J.	54 Indiana	Shot in breast	"	"	do 5th day
67	R. P.	22 K'tucky	do right breast	"	"	do 9th day
68	A. M.	54 Indiana	do shoulder and foot	"	"	do
69	T. M.	114 Ohio	do side and back	"	"	do 12th day
70	R. S.	3 Kentucky	do side	"	"	
71	S. H.	57 Ohio	Flesh wound, neck	"	"	
72	G. R. R.	83 Indiana	Shot through left shoulder	"	"	Died 1st day
73	E. W.	do	Bullet penetrating left lung	"	"	
74	J. B.	127 Illinois	Flesh wound, right shoulder	"	"	
75	F. H.	54 Ohio	Contusion of epigastrium by shell	"	"	
76	C. R.	do	General concussion by shell	"	"	
77	W. H.	do	do	"	"	
78	E. V.	do	Contusion of body by shell	"	"	Died
79	J. D. P.	do	Ball penetrated abdomen near naval	"	"	
80	R. L. V.	6 Missouri	Contusion from spent ball on chest	"	"	
81	R. W.	54 Ohio	Bullet pierced right lung	Ball extracted	None	
82	J. S.	13 Regulars	do flesh of back	" cut out at shoulder	"	
83	J. S.	6 Missouri	do pierced right lung	" " of back	"	
84	A. B.	13 Regulars	Contusion of back from shell	None		
85	Y. F. D.	do	Flesh wound, back of neck	Ball extracted	Ball not extracted	
86	M. C.	do	Bullet entered back and pierced left lung	" not extracted		
87	J. F.	do	Flesh wound, pectoral muscles	None		
88	M. C.	do	Contusion, left shoulder	"		
89	Col. B.	do	Bullet pierced right lung	"		
90	T. S.	do	Ball entered back and pierced left lung	"		
91	J. D.	do	Shot in left lung	"		Died
92	M. McN.	do	do	"		
93	J. M.	do	do abdomen	"		

Case.	Name.	Regiment.	Injury.	Operation.	Anes- thetic.	Remarks.
94	H. H.	do	Flesh wound in back	"		Died
95	E. Z.	do	do right shoulder	"		Returned to duty
96	J. S.	do	Shot in abdomen	"		do
97	W. S.	22 Kentucky	Contusion of shoulder	"		Nearly well 8th day
98	B. S.	16 Ohio	General concussion	"		Returned to duty
99	W. A.	54 Indiana	do	"		do
100	J. D.	do	do	"		do
101	M. C. H.	do	do	"		do
102	R. M. C.	42 Ohio	do	"		do
103	J. S.	120 do	do	"		do
104	A. J.	do	do	"		do
105	E. B.	13 Illinois	Shell wound, perforating intestine	"		Died 8th day
<i>Addenda from notes of other Western Battles.</i>						
106	J. C.	8 Missouri	Shot thro' abdomen, piercing colon	Bullet cut out from back	None	Died 4th day of peritonitis
107	M. W.	6 do	Large piece of shell in lumber muscle	Extracted	"	Result unknown
108	C. H. C.	do	Bullet passed thro' right arm into thorax	None		do
109	S. S.	4 Ind. Bat.	Bullet thro' left shoulder, frac. of clavicle	Extracted fragments	Chlor.	Doing well 14th day
110	J. H.	Servant	Stab'd in abdomen, cutting small intestine	Intestines sewed up with interrupted sutures & return'd	Chlor.	Recovered readily; had hernia some months after
111	J. B.	40 Illinois	Bullet pierced thorax	Extracted	Chlor.	Recovered
112	B. D.	do	do fracture of 7th rib	Resected rib	"	do
113	A. A.	46 do	Compound fracture of scapula	Extracted fragments	"	do
114	— D.	40 do	Ball enter'd r. thorax, extensive emphysema	Tapped	None	do
115	S. S.	do	Shot in left shoulder, and frac. of 1st rib	None		do
116	O. E.	do	Comp. fracture of scapula, — grapeshot	"		do
117	S. H.	Unknown	do head of humerus, thorax pierc'd	"		Unknown
118	M. L.	41 Illinois	Flesh wound of neck	"		Died 9th day of 2d hemorrh.
119	J. B.	6 do	Stab'd in abdomen, viscera not wounded	"		Recovered
120	R. N.	Servant	Stabbed, cutting subscapular artery	Cut down and tied	Chlor.	do



121	A. B.	Contraband	Pistol-shot in lung, by his master	None	Died 10th day
122	C. C.	do	Shot in shoulder, by his master	do	Recovered
123	C. S.	do	do hip	Extracted ball	do
124	S. S.	6 Ill. Cav	Shot in arm and breast, flesh wound	None	do
125	—	do	Flesh wound in breast by buckshot	do	do
126	—	do	do side	Extracted	do
127	—	do	do	do	do

With these should be reckoned forty-seven slight cases wounded at Vicksburg, who were not disabled, and remained with their Regiments. Total wounds of Neck, Trunk, and Shoulder, 174.

#### WOUNDS OF ARM.

1	C. S.	42 Ohio	Fracture of head of humerus	Resection on the field	Chlor.
2	W. W.	54 Indiana	Flesh wound near elbow	None	Doing well 20th day
3	C. G.	16 Ohio	do right arm	do	Has fever 20th day
4	G. C.	30 Missouri	Shell wound of arm, very bad comp. frac.	Primary amputation	Tolerably well 15th day
5	J. C. McC.	49 Indiana	Compound fracture head humerus	None	Doing well 15th day
6	W. F. P.	69 do	Ball entered top shoulder, passed 4 inches down arm	Ball extracted	do
7	J. E.	22 Kentucky	Compound fracture, left arm	None	do
8	R. W.	54 Indiana	Bad flesh wound, right arm	do	do
9	E. F. T.	do	Flesh wound	do	do
10	B. B.	16 Ohio	do both arms	do	Doing well 16th day
11	F. C. M.	13 Illinois	do left arm	do	do
12	C. A. B.	do	do right arm	do	do
13	M. G.	58 Ohio	do do	do	do
14	W. M. B.	22 Kentucky	do do	do	do
15	C. G.	16 Ohio	do arm	do	do
16	S. S. J.	54 Indiana	Compound fracture, humerus	Secondary amput. at upper 3d	do
17	E. O. G. R.	16 Ohio	Flesh wound, middle of arm	None	do
18	H. J. E.	114 do	Flesh wound, ball enter'd arm and pass'd out at shoulder	do	17th day 18th day
19	P. H.	16 do	Flesh wound, upper part of arm, injuring artery. 2d hæmor. & gangrene 11th day	Ligated subclavian 11th day, amputated arm	do
					Recovered



20	W. S.	127 Illinois	Compound fracture head of left humerus	Exsection on field	Chlor	Doing well 18th day
21	W. A.	58 Ohio	do do of humerus	Primary amp. shoulder-joint	do	do
22	A. H. T.	4 Iowa	do do	Resection of shoulder	do	do
23	W. J. C.	do	Flesh wound left arm and breast	None	do	do
24	Z. B. F.	13 Illinois	Compound fracture right humerus	do	do	do
25	J. S.	do	do do	do	do	do
26	R. A. L.	83 Indiana	do do left humerus & radius	Bullet and pieces of bone cut out by deltoid muscle	do	do
27	J. A. H.	13 Illinois	do do humerus	Amputation at shoulder-joint	do	do
28	G. W. D.	4 Iowa	do do	High amputation on field	do	do
29	D. A. C.	29 Missouri	do do	Amp. near shoulder on field	do	do
30	L. H. E.	6 do	do do	Shoulder resected on field	do	do
31	S. G.	13 Illinois	do do by shell	Primary amputation	do	do
32	W. B.	55 do	do do bad	None	do	do 20th day
33	H. V.	22 Kentucky	do do	Amputation at shoulder-joint	do	Died 9th day
34	J. P.	do	do do right arm	None	do	do 7th do
35	G. W. F.	57 Ohio	do do by shell	Primary amp. at lower 3d	do	do
36	W. B.	55 Illinois	do do humerus	Bullet cut out	do	do
37	S. B. C.	13 Regulars	do do	Resection of shoulder	do	do
38	— I.	6 Missouri	Flesh wound right arm	None	do	do
39	J. H.	54 Indiana	do do slight	do	do	Nearly well 12th day
40	E. B. P.	do	Compound fracture arm	Primary amputation	do	Doing well 6th day
41	J. R.	do	do do	do	do	do
42	H. C. B.	16 Ohio	Flesh wound arm	None	do	do
43	J. J.	Unknown	Compound fracture humerus	Amputation shoulder-joint	do	Doing well 28th day

*Addenda from notes of other Western Battles.*

44	C. V.	do	do do	do do	do	do 15th day
45	C. S.	do	do do	do do	do	Died 4th day
46	S. S.	do	Arm torn off at the shoulder by shell	No amputation, artery tied	None	do
47	S. W.	8 Missouri	Comp. fracture head of humerus & lo. jaw,	Resection of shoulder-joint	Chlor	Recovered
48	C. C. M.	40 Illinois	Flesh wound right arm	None	do	do
49	S. S.	6 Ill. Cav.	do do do	Extracted buckshot	None	do
50	H. E.	do	do do do	do	do	do

With the above should be reckoned 18 slight wounds of the arm, from the Vicksburg Battles, which remained with their Regiments, and all recovered. Total injuries of the Arm, 69.

### WOUNDS OF ELBOW.

Case	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
1	J. I.	42 Ohio	Left elbow-joint opened	None		Arm cons'ly swollen 15th day
2	J. McH.	49 Indiana	Flesh wound elbow	do		Doing well 16th day
3	T. G. C.	54 do	Contusion from cannon ball	do		do
4	F. E. L.	7 Mich. Bat.	Shell wound right elbow	Amputation of arm on field		Erysipelas, better on 17th day
5	J. H.	13 Illinois	Bullet through right elbow	None	Chlor.	Doing well 18th day
6	M. H.	do	Comp. frac., right elbow	do	do	do
7	F. M. S.	6 Missouri	do also flesh w'd. in neck	Resected elbow-joint		do
8	J. H.	83 Indiana	Comp. fracture elbow-joint	None		do
9	E. A.	116 Illinois	Comp. fracture left elbow-joint	Amputation of arm	do	do
10	P. H.	16 Ohio	do right	do	do	6th day

### Addenda from notes of other Western Battles.

11	D. D. D.	8 Missouri	Comp. fracture right elbow-joint	Excision of joint	do	Recovered
12	E. B.	53 Illinois	do	do	do	Doing well 16th day
13	W. M.	Unknown	do	Joint excised 8th day	do	Died same day
14	G. W.	40 Illinois	do left	Extracted fragments	do	Recovered, on duty

Total injuries of the Elbow, 14.

### WOUNDS OF FORE-ARM.

1			Flesh wound ball lodged between radius and ulna near elbow	Extracted 12th day	Un'kn	Had erysipelas doing better prospect good on 20th day
2	G. W. H.	16 Ohio	Flesh wound	None	None	Doing well 15th day
3	A. R.	do	do	Ball not extracted	do	Erysipelas on 15th day
4	S. J. H.	49 Indiana	Bullet passed between radius and ulna	None	do	Tolerably well on 15th day
5	C. F.	16 Ohio	Compound fracture of ulna	do		Doing well 16th day
6	J. T. B.	42 Ohio	Flesh wound, ball entered near wrist and passed out above elbow	do		do

7	D. T. D.	22 Kentucky	Flesh wound right fore-arm	None		Fever on 16th day
8	H. A. B.	do	do left fore-arm	do		Doing well 16th day
9	S. S.	16 Ohio	do	do		do
10	A. S. D.	29 Missouri	do right fore-arm	do		do
11	A. S. D.	22 Kentucky	Compound fracture, both bones	Amputated lower 3d of arm	Chlor.	Doing well 17th day
12	E. B. P.	54 Indiana	do do by grape	None		do
13	J. R.	42 Ohio	Ball lodged in bone	Bullet not extracted		Erysipelas 17th day
14	L. R.	31 Missouri	Flesh wound left fore-arm	None		Doing well 18th day
15	J. P.	16 Ohio	do right do	do		do
16	W. W. J.	31 Missouri	Compound fracture right fore-arm	do		do
17	H. M. B.	29 do	Bullet passed between bones	do		do
18	J. J. M.	31 do	Flesh wound fore-arm	do		Had erysipelas on face, doing well 16th day
19	J. W.	do	do right fore-arm	do		Doing well 18th day
20	E. E.	116 Illinois	Compound fracture do	Amputation on field	Chlor.	do
21	H. W. B.	29 Missouri	do do left fore-arm	None		Not doing well 18th day
22	C. M.	6 do	Shell fractured radius	do		Doing well 18th day
23	M. S.	9 Iowa	Flesh wound right fore-arm	do		do
24	R. A. S.	4 do	do left do	Primary amputation	do	do 20th day
25	R. A. S.	13 Illinois	Compound fracture middle of fore-arm	None		do
26	G. O.	83 Indiana	do left ulna	Extracted piece of shell and fragment of bone	None	
27	C. I.	6 Missouri	do ulna by shell	Bullet extracted	do	
28	R. G.	do	Flesh wound right fore-arm	None		
29	B. A.	do	do left do	do		
30	A. S.	69 Indiana	Compound fracture fore-arm	do		
<i>Addenda from other Western Battles.</i>						
31	J. H.	1st Ill. Art.	Fore-arm blown off	Amputation, middle fore-arm	Chlor.	Recovered
32	J. M.	40 Illinois	Compound fracture, left radius	None	do	do
33	J. B.	29 do	do	Extracted fragments	do	do
34	J. M.	40 Illinois	Flesh wound, left fore-arm	None	do	do
35	—	6 Ill. Cav.	Buckshot in right fore-arm	Extracted	do	do

With the above should be reckoned 8 cases of slight wounds of fore-arm, received in the Vicksburg fights, which remained with their regiments. Total wounds of fore-arm, 43.

# WOUNDS OF HAND.

Case	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
1	Z. M.	34 Indiana	Flesh wound, hand	None	None	Doing well 15th day
2	H. A. D.	114 Ohio	Bullet through hand	do	do	do
3	H. C. B.	16 Ohio	Compound fracture of wrist by shell	do	do	Doing toler'y well 15th day
4	G. D. C.	54 Indiana	Ball fract'd 2d finger right hand, entered centre left hand, pas'd out above wrist	Ball cut out above left wrist; finger amputated	Chlor.	Doing well 15th day
5	G. S.	42 Ohio	Flesh wound, fingers	None	do	do
6	W. G.	114 Ohio	Fracture of index finger	Amputated	do	do
7	D. C. H.	69 Indiana	Flesh wound, left index finger	None	do	do
8	E. R. C.	do	Comp. fracture of all fingers of 1 hand	Amputation of all 4 fingers	do	Hand ulcerated 15th day
9	W. S.	42 Ohio	do 2 fingers	do	do	Doing well 15th day
10	G. S.	22 Kentucky	do ring finger	do	do	do
11	J. D.	54 Indiana	do index finger	Secondary amputation	do	Doing well 15th day
12	J. M.	16 Ohio	do	Primary do	do	do 16th day
13	D. D.	do	Fingers of right hand destroyed by shell	Secondary do	do	Feverish
14	J. M. R.	4 Iowa	Left hand	None	do	Doing well 16th day
15	L. C.	16 Ohio	Right hand	Amputation of thumb	do	do
16	S. Z.	114 Ohio	Right index finger	Secondary amputation	do	do
17	A. C.	do	do	do	do	do
18	N. T.	do	do	do	do	do
19	A. S. P.	30 Iowa	Wound, right hand	None	do	do
20	H. B.	16 Ohio	Wound, left hand	do	do	do
21	C. P.	do	Shell wound, right hand	Index finger amputated	do	do
22	C. M.	58 Ohio	Right hand	None	do	do
23	J. F.	114 Ohio	do	do	do	do
24	W. Z.	do	Fracture of 2 fingers	Secondary amputation	do	Doing toler'y well 15th day
25	G. S.	16 do	do left ring finger	Amputated	do	Doing well 15th day
26	M. L.	7 Mich. Bat.	Flesh wound, left hand	None	do	On duty 17th day

27 J. T.	54 Indiana	Fracture of all fingers on left hand	Amputated all	Chlor.	Doing well 17th day
28 J. McG.	16 Ohio	Articulation of index finger shot out	No operation		Finger saved
29 A. L.	54 Indiana	Shell wound, right hand	do	do	Doing well 17th day
30 P. B. F.	55 Illinois	Fracture of two fingers	Amputation of 1	do	do
31 A. R.	29 Missouri	do ring finger, right hand	do	do	do 18th day
32 W. C.	13 Illinois	Shot, left hand	do	do	Not doing well 18th day
33 G. S.	31 Missouri	do	None	do	Died 12th day of tetanus
34 J. H. Y.	116 Illinois	Compound fracture, 2d metacarpus	Resection of metacarpal; finger afterwards removed	do	
35 J. B.	83 Indiana	Compound fracture, left index finger	Amputation on field	None	
36 A. J. P.	83 Ohio	do right do	do	do	
37 J. H.	55 Illinois	Shot through left hand	None	Chlor.	
38 M. C.	127 Illinois	Compound fracture, thumb	Primary amputation		
39 T. T.	6 Missouri	Shot in left wrist	None		
40 T. C.	54 Ohio	Compound fracture, metacarpus	do	do	
41 G. C.	116 Illinois	Compound fracture, right index finger	Amputation	do	
42 J. S.	6 Missouri	do do	do	do	
43 F. B.	116 Illinois	metacarpus, left hand	Removed fragments	do	
44 W. C.	13 Regulars	do left wrist	do	None	
45 C. C. M.	22 Kentucky	Sub-luxation of wrist	Reduced	do	Nearly well 7th day
46 G. C.	16 Ohio	Shot across little finger	None	do	do 10th day
47 J. V. O.	do	do left index finger	do	do	do
48 J. M. B.	54 Indiana	do right do	do	do	do
49 H. M.	120 Ohio	Index finger shot off	Amputation	Chlor.	Doing well 8th day
50 J. S.	16 Ohio	do	do	None	do
51 E. H.	54 Indiana	Flesh wound, hand, slight	None	do	do
52 G. E.	16 Ohio	Compound fracture, finger	Amputated	Chlor.	do

*Addenda from notes of other Western Battles.*

53 W. W.	17 Illinois	Flesh wound, left hand	None	Recovered	
54 Col. P.	10 do	Compound fracture, left wrist	do	do	hand saved
55 B. B.	42 do	Compound fracture, right metacarpus	Excised 1 metacarpal bone	do	
56 Z. W.	13 Iowa	Flesh wound, right hand	None	do	
57 —	6 Ill. Cav.	Buckshot through hand	do	do	

With the above should be reckoned about 20 trivial wounds of the hand, received in the fights near Vicksburg, which did not leave the regiment except for one dressing. Total wounds of the hand, 77.

# WOUNDS OF HIP.

Case	Name.	Regiment.	Injury.	Operation.	Anaesthetic.	Remarks.
1	E. H.	49 Indiana	Ball ent'd n't ant. sup. spin. process of ilium, & travers'd flesh n'r post. sup. spin. process	Ball extracted	Un'kn	Doing well 20th day
2	J. T.	120 Ohio	Shell flesh wound left hip and nates	None		Cannot walk 15th day
3	A. B.	do	Shell wound right hip and back	do		Walks 15th day
4	T. P.	22 K'ntucky	Flesh wound left hip	do		Doing well 16th day
5	J. W.	120 Ohio	do do	do		do
6	B. F. W.	13 Illinois	do nates	do		do
7	A. F.	22 K'ntucky	do left groin	do		do
8	C. S.	do	do left hip	do		do
9	A. K.	42 Ohio	Ball entered flesh at hip and ran up to arm under the skin	Ball extracted		do
10	E. P. C.	49 Indiana	Bullet entered above left pubis	Extracted 6 in. right of penis	None	Abscess formed in scrotum, doing well on 17th day
11	J. B. W.	16 Ohio	Shell contusion of hip	None		Left leg entirely paralyzed
12	J. S.	54 Indiana.	Flesh wound left hip	do		Doing well 17th day
13	B. J. C.	31 Missouri	do do groin	do		do
14	T. D. D.	30 Iowa	Bullet entered right hip	Cut out middle of thigh		do 18th day
15	T. W. G.	127 Illinois	do left hip and passed out just above knee	None		do
16	J. G.	29 Missouri	Flesh wound right hip near joint	Not extracted		do
17	J. A. V.	31 do	do do	None		do
18	W. H.	29 do	do left hip	do		do
19	A. O.	13 Illinois	do right groin	Ball not extracted		do
20	P. O.	6 Missouri	Hip and leg	None		Feels well 18th day
21	E. T. O.	49 Indiana	Shot in left hip	do		Doing well 20th day
22	W. A. K.	3 Ill. Cav.	Left groin ranging up	do		Died 1st day do 8th day

23	M. L. S.	Brig. Gen.	Ball pierc'd ala of ilium & lodg'd in cancellous tissue of brim of pelvis, viscera not wound'd	Ball pried loose and extract- ed 10th day	Ether Chlor.	Doing finely 26th day
24	H. Z.	83 Indiana	Shell wound of hip, viscera not wounded	None		
25	J. A. B.	54 Ohio	Contusion right hip	do		
26	J. W. M.	13 Regulars	Flesh wound right groin	Bullet extracted	None	
27	W. R.	6 Missouri	do left hip	None		
28	J. N.	do	Contusion right hip			

*Addenda from notes of other Western Battles.*

29	J. L.	Unknown	Flesh wound right hip	Bullet extracted	Chlor.	Recovered
30	H. S.	do	do also of left leg	None		do
31	R. F.	25 K'tucky	Bladder pierced and both femurs fractured	do		Died 19th day
32	T. S.	Unknown	Flesh wound in groin	do		Recovered
33	J. S. B.	13 Iowa	Ball enter'd cavity of pelvis, viscera unhurt	do		do
34	J. B.	6 Ill. Cav.	Flesh wound, hip	do		do

With the above should be reckoned 7 cases of slightly wounded in the hip at the Vicksburg fights, who did not leave their regiments except for one dressing. Total wounds of the hip, 41.

WOUNDS OF THIGH.

1	W. D. M.	16 Ohio	Flesh wound, thigh	None	None	Doing very well 15th day
2	J. T.	54 Indiana	Right thigh torn off by shell	Amputation on field	Chlor.	do
3	H. C. B.	16 Ohio	Flesh wound, right thigh	None	None	do
4	S. B.	49 Indiana	do	Ball extracted	do	do
5	C. W. G.	16 Ohio	do	do 15th day		Had erysipelas; pusburrow'd.
6	J. S.	54 Indiana	do left thigh	Ball not extracted		Better 16th day
7	P. W.	16 Ohio	do thigh	None		Doing toler'y well 15th day
8	W. F.	do	do by shell	do		Feverish 15th day
9	J. D.	54 Illinois	do do by bullet	do		On duty
10	P. C.	58 Ohio	do right thigh	do		Doing well 15th day
11	M. C.	4 Iowa	do left thigh	do		do
12	C. G.	54 Indiana	do right thigh	do		do
13	T. A.	do	do left thigh	do		do



Case	Name.	Regiment.	Injury.	Operation.	Anaesthetic.	Remarks.
14	J. W. H.	do	Flesh wound, right thigh	None		Doing well 15th day
15	S. B.	do	Shell wound, right thigh and knee	do		do do
16	J. H. A.	16 Ohio	Flesh wound, right thigh	do		do do
17	T. W. F.	13 Illinois	do do left thigh	Ball extracted	None	do do
18	W. P. C.	22 Kentucky	do do	None		do do
19	A. S.	do	do do	do		do do
20	C. M.	54 Indiana	do right thigh	Ball not extracted		do do
21	R. E.	16 Ohio	do left thigh	2nd'y hemor. 7th day from profunda,—tied the vessel;		do do
22	J. W. C.	49 Indiana	Severe flesh wound of thigh	hemor, again 9th day from femoral, tied that also		do do
23	G. T.	29 Missouri	Flesh wound, thigh	None	Chlor.	do 20th day
24	A. W.	58 Ohio	do right thigh	do		do 17th day
25	B. A.	22 Kentucky	do thigh	Cut out bullet		do do
26	S. S.	54 Indiana	do right thigh	Bullet not extracted		do do
27	W. W. F.	16 Ohio	do do	None		do do
28	J. C.	22 Kentucky	do do	do		do 18th day
29	M. L.	do	left thigh	do		do do
30	A. D.	16 Ohio	do thigh	do		do do
31	H. H.	do	do left thigh	do		do do
32	J. Y.	do	do right thigh	do		do do
33	J. A. R.	do	do left thigh	do		do do
34	J. S. C.	22 Kentucky	do do	do		do 17th day
35	T. S.	83 Indiana	do thigh	do		do do
36	B. S.	6 Missouri	do do	do		do 18th day
37	J. G. M.	13 Illinois	do do	do		do do
38	A. E. B.	do	do left thigh	do		do do
39	G. W. W.	do	do both thighs	do		do do
40	C. J.	8 Missouri	Ball ent'd thigh n'r knee, escap'd from hip	do		do do
41	C. M. C.	6 do	Comp. frac. left thigh & flesh wound of right	Left thigh amputated on field.	do	do do



Case	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
42	L. H.	6 Missouri	Flesh wound, both thighs	None		Doing well 18th day
43	F. T.	29 do	right thigh	do		do
44	J. J. Y.	116 Illinois	left thigh	do		do
45	C. H.	13 Regulars	do	do		do
46	G. H.	31 Missouri	thigh	do		do
47	M. F. B.	13 Illinois	right thigh	do		do
48	J. B.	25 Iowa	left thigh	do		do
49	A. R.	31 Missouri	do	do		do
50	J. S.	do	right thigh	do		do
51	G. R.	6 do	both thighs and scrotum	do		do
52	S. C.	4 Iowa	left thigh	do		do
53	D. L. C.	31 Missouri	both thighs	do		do
54	W. McA	13 Regulars	left thigh	do		do
55	E. R.	13 Illinois	right thigh	do		do
56	A. M.	do	left thigh	do		do
57	J. W.	31 Missouri	do	do		do
58	G. S.	42 Ohio	do	do		do
59	J. B. S.	49 Indiana	Compound fracture, thigh	do		Died of typhoid fever 12th day
60	G. H.	69 do	Shell wound, both thighs and scrotum	do		Died 13th day
61	P. H.	42 Ohio	Compound fracture, thigh	do		Died of pyæmia 10th day
62	J. C. S.	69 Indiana	do left middle 3rd	do		Died 1st day
63	J. C. L.	114 Ohio	Flesh wound, upper 3rd, thigh, and penis	do		Died 10th day
64	J. W. R.	51 Indiana	Compound fracture, middle 3rd	do		Died 8th day of erysipelas
65	P. F.	57 Ohio	do both femurs, by grape, and left femoral artery cut	do		Died 5th day
66	J. C.	6 Missouri	Flesh wound, thigh and ankle	do		Died 1st day
67	M. S.	do	do	do		
68	J. M.	do	Contusion, right thigh	do		
69	G. W.	do	Flesh wound, both thighs	Bullet extracted		
70	J. B.	22 Kentucky	do thigh	None	Chlor.	
71	J. M. C.	49 Indiana	Shell flesh wound, both thighs,—bad case	do		Tendency to gangrene

*Addenda from notes of other Western Battles.*

72	O. S.	Unknown	Comp. fracture, femur, by cannister-shot	Primary ampu., upper 3rd	Chlor.	Died in 24 hours
73	Unknown	do	left femur	do middle 3rd	do	Died 3rd day on boat
74	do	do	right femur	do upper 3rd	do	Died 4th day
75	do	do	femur,—musket	do lower 3rd	do	Alive 14th day
76	E. S. S.	Missouri	left femur: artery destroyed	do upper 3rd	do	Died 5th day
77	C. B.	do	Compound fracture, middle of femur	Pick'd out fragments, resected ends, put up in splints	Chlor.	
78	R. C.	55 Illinois	do	do do	do	Died 4th day
79	H. H.	6 Missouri	Bad contusion in front of thigh; muscles reduced to pulp	Crucial incision	do	Died 3rd day
80	S. S. B.	30 Indiana	Ball enter'd top & front of thigh: flesh w'd	Enlarged opening to search for bullet	Alive 14th day	
81	J. McC.	48 Illinois	Compound fracture, upper 3rd femur	Ampu. 6th day, at upper 3rd	Chlor.	Died of gangrene 9th day
82	H. H.	Unknown	Flesh wound, 1-ft thigh	Extracted bullet	Recovered	Died 7th day of shock of operation
83	C. K.	43 Illinois	Compound fracture, femur, upper 3rd	Amputation, upper 3rd	Chlor.	do
84	D. E.	48 do	Flesh wound, thigh	Bullet extracted	None	do
85	E. R.	112 Iowa	Compound fracture, upper 3rd femur	None	Alive 35th day: bone exfoli.	
86	Lieut. C.	Unknown	Comp. frac., neck of femur, by ball; lay 20 hours on field, and froze tips of toes	Long splint applied, and adhesive strap extension	Recovered with shortening: walks about	
87	F. H.	49 Illinois	Flesh wound, right thigh	None	Recovered	do
88	—	79 Ohio	Shot through thigh, wounding femoral artery: secondary hemorrh. 10th day	Ligated femoral artery 10th day		

With these should be reckoned 19 slight cases of injuries to the thigh, received at the fights near Vicksburg, which were returned to their regiments. Total wounds of the thigh, 107.

WOUNDS OF KNEE.

1	R. W.	49 Indiana	Fracture, knee	Ampu. (prim.) lower 3rd thigh	Chlor.	Doing well 20th day
2	C. G.	16 Ohio	Flesh wound	None	None	do passably 15th day
3	D. L.	54 Indiana	Bad fracture by shell	Amputation of thigh on field	Chlor.	do well do
4	F. D.	do	Contusion by shell	None		Joints swollen, walks with crutches 15th day
5	G. M. W.	do	do	do		Well on 16th day
6	P. H. B.	49 do	Cann-shot, left knee, flesh	do		Erysipelas 16th day

7 P. K.	69 Indiana	Flesh shell wound	None	Primary amputation of thigh	Chlor.	Doing well 16th day
8 J. A. C.	54 do	Compound fracture by bullet	Primary			Flap sloughed, bone resawed 20th day
9 J. McG.	6 Missouri	Bullet wound, left knee and foot; flesh wound, right foot and leg	2ndary	amputation 16th day	do	Not doing well 20th day
10 J. G.	31 Iowa	Flesh wound, knee; joint not opened	None	Thigh amputated on field	do	Doing well 18th day
11 H. E.	13 Regulars	Shot through right knee	None		do	do 20th day
12 J. B. M.	127 Illinois	Shell flesh wound inside of knee	Primary	amputation, thigh	do	Died 6th day
13 J. N. L.	42 Ohio	Shot through right knee	do	do	do	Died without reaction 5th day
14 E. F. C.	54 Indiana	do	do	do	do	
15 C. McC.	6 Missouri	do left knee	None	Amputated thigh, lower 3rd	do	Doing well 6th day
16 W. S.	13 Regulars	Flesh wound, left knee	Amputated	thigh, middle 3rd	do	Died 6th day
17 J. H. L.	42 Ohio	Compound fracture knee				
18 E. T. C.	54 Indiana	do				

*Addenda from notes of other Western Battles.*

19 J. Z. B.	46 Illinois	Compound fracture, knee	No operation		Chlor.	Died 10th day
20 E. V.	42 do	do	Resection of joint			Recovered

With the above should be reckoned 5 cases of slight flesh wounds of the knee of no importance, and which remained with their regiments. Total wounds of the knee, 25.

WOUNDS OF LEG.

1 P. C.	22 Kentucky	Fracture, tibia	Amputation, middle of leg	Chlor.	Doing well 20th day
2 V. S.	49 Indiana	do	Amputated upper 3rd on field	do	do
3 A. V.	42 Ohio	Flesh wound, calf of leg	None	None	Had erysip., doing well 15 day
4 S. B.	12 do	Shell w'nd, knee, leg & foot all flesh w'nds	do	do	Doing well 19th day
5 M. H.	54 Indiana	Wound of calf (flesh)	do	do	do 15th day
6 O. S.	22 Kentucky	Flesh wound by shell	do	do	do
7 Z. M.	34 Indiana	do calf of leg	do	do	do
8 A. K.	54 Indiana	do	do	do	do
9 J. M.	16 Ohio	do in front of tibia	do	do	do
10 L. E. C.	42 Ohio	Bayonet wound in front of tibia	do	do	Doing well 15th day
11 V. M.	29 Missouri	Flesh wound, calf	do	do	do
12 J. B.	54 Indiana	do leg	do	do	do 16th day

(No.)	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
13	F. W.	58 Ohio	Flesh wound, leg	None		do
14	J. A. B.	54 Indiana	do left calf	do		do
15	H. S.	4 Iowa	do do ankle	do		do
16	A. H.	16 Ohio	Severe flesh wound	do		do
17	B. H.	29 Missouri	Flesh wound, left calf	do		do
18	H. A. K.	13 Illinois	do right calf	do		do
19	W. A. M.	do	do do	do		do
20	G. F.	42 Ohio	do left leg	do		do
21	H. C.	13 Illinois	do right leg	do		do
22	E. C.	do	do do	do		do
23	L. S.	22 Kentucky	Compound fracture, left leg	do		do
24	J. S.	do	Flesh wound, right leg	do		Doing toler'y well 16th day
25	W. F.	54 Indiana	do leg	do		Doing badly 16th day
26	D. G.	42 Ohio	Compound fracture, int. malcolus	do		Doing well 17th day
27	S. L. W.	114 do	Foot torn off by shell	Pr. ampu. at lower 3d of leg		No improvement 17th day
28	T. P.	54 Indiana	Flesh wound, right calf	None	Chloro.	Doing well 18th day
29	M. W. M.	16 Ohio	do left do	do		do
30	J. D.	54 Indiana	do do 2 balls	do		do
31	M. K.	58 Ohio	do calf	do		do
32	J. W. M.	43 do	Shell comp. fracture, left leg & right foot	pr. ampu. mid. 3d l. leg, r. meta	do	do
33	W. H.	54 Indiana	Flesh wound, left calf	None		do
34	A. L.	do	Bullet flesh wound, right leg	do		do
35	G. F.	31 Missouri	Contusion by shell, right leg	do		do
36	J. B.	17 Missouri	Shell wound, left leg	None		Erysipelas 18th day
37	D. B. S.	116 Illinois	Bullet wound, calf	do		Doing well 18th day
38	T. W. S.	6 Missouri	Compound fracture, leg	do		do
39	L. J. Kerr	do	Flesh wound, leg	do		do
40	H. W.	13 Illinois	Grape-shot, left calf	do		do
41	P. S.	17 Missouri	Shell wound, left leg	do		do
42	N. B.	54 Ohio	Compound fracture, both bones	do		do
43	C. C.	31 Missouri	Flesh wound, left calf	do		do 20th day

44	F. F.	58 Ohio	Shell flesh wound, right leg	None	Primary amputation	Chlor.	Doing well 20th day
45	J. W. P.	22 Kentucky	Compound fracture, left leg	None	None		Died of pyæmia 15th day
46	A. R. G.	49 Indiana	Gun-shot, both legs and 1 hand	Unknown	Unknown		do 1st day
47	J. C.	do	Compound fracture, left leg	None	None		do 9th day
48	E. D.	51 do	do do	do	do		do 11th day
49	A. R.	do	Shot in both legs and shoulder	do	do		do 7th day
50	W. R.	58 Ohio	Shot in ankle	do	do		do 11th day
51	C. A.	114 do	Flesh wound, both legs	do	do		do 15th day of tetanus
52	W. N.	13 Regulars	do calf	do	do		
53	P. O.	6 Missouri	do right leg	do	do		
54	J. E. B.	120 Ohio	do leg	do	do		
55	J. A. P.	22 Kentucky	Compound fracture, leg	Primary amputation	do	do	Nearly well 10th day
56	J. T.	54 Indiana	do do	do	do	do	Doing well 6th day
57	G. W. F.	57 Ohio	do ankle	do	leg	do	do
58	J. M. M.	42 do	do right leg	do	do	do	do
59	R. W.	49 Indiana	do leg	do	do	do	do
60	E. L.	16 Ohio	do left leg	do	do	do	Doing very well 6th day
61	P. S.	49 Indiana	do do	do	do	do	Doing well 6th day

### Addenda from notes of other Western Battles.

62	O. R.	Unknown	Leg taken off by cannon-shot	Flap amputation of thigh	Chlor.	Died 4th day,—no reaction
63	T. S.	do	Flesh wound, right leg	None	Recovered	
64	J. McD.	42 Illinois	Compound fracture, left fibula	Resection of fractured part	do	do
65	E. S.	40 do	Flesh wound, left leg	None	do	do
66	E. B.	21 Missouri	do do	do	do	do
67	—	6 Ill. Cav.	Back-shot went thro' leg between bones	Cut out behind the calf	None	do

To the above should be added 12 slight injuries of the leg, received in the battles near Vicksburg, which did not leave their regiments. Total wounds of the leg, 79.

WOUNDS OF FOOT.

No.	Name.	Regiment.	Injury.	Operation.	Anæsthetic.	Remarks.
1	S. L.	29 Missouri	Head of metatarsus of great toe	Ball extracted 12th day		Doing well 19th day
2	F. L.	16 Ohio	Fracture ankle joint	Amput. lower 3d leg on field	Chlor.	do 20th day
3	T. F. W.	12 do	do second toe	Amputation at base of toe	do	do
4	G. W. T.	57 do	Foot torn off by shell	do lower 3d leg	do	do 15th day
5	F. W. W.	59 Indiana	Right os calcis crushed	Ball extracted on field	None	(Considerable swelling 15 day
6	W. H.	114 Ohio	Flesh wound, 3 toes	None		Had crysip.—better 15th day
7	J. S.	29 Missouri	do sole of foot	do		Doing well 15th day
8	E. T.	22 Kentucky	do left heel	do		Doing well 16th day
9	C. S.	58 Ohio	do do	do		Wearing shoes 16th day
10	W. C. F.	42 do	do left foot	do		Doing well do
11	J. H.	16 do	Gun-shot, left foot	do		do do
12	P. U.	54 do	do 2 toes left foot	Primary amputation		do do
13	A. J. McG	29 Missouri	Contusion of right foot by round shot	None		do do
14	J. C.	22 Kentucky	Grape shot wound, right foot	do		Very sore do
15	E. S.	31 Missouri	Shell wound, left foot	do		Doing well do
16	C. H.	29 do	do do ankle	do		do do
17	J. L. H.	114 Ohio	Compound fracture right foot	do		do do
18	T. K.	22 Kentucky	Wound, right foot	do		Had crysip.—better 15th day
19	J. G. K.	7 Mich. Bat.	Flesh wound, left ankle	do		Doing well 17th day
20	E. W.	54 Indiana	Ball passed through left foot	do		do do
21	J. E.	16 Ohio	Compound fracture, great toe	do		do do
22	C. A.	22 Kentucky	Shot through left foot	do		do do
23	W. C.	76 Ohio	do do	do		do do
24	J. H.	51 Indiana	Shell wound, right foot	do		do do
25	W. H. M.	do	Shell wound, right foot	do		do do
26	M. S.	22 Kentucky	Gun-shot, right foot	do		do do
27	J. K. C.	29 Missouri	Shot across foot	do		do do
28	W. B.	1 Iowa	Shell wound, left foot	do		do do
29	A. M.	do	Left foot	do		do do
30	D.	6 Missouri	Left foot	do		do do

31 J. E.	29 do	Left foot	None	do
32 S. C. D.	37 do	Flesh wound, foot	do	do
33 S. W. W.	13 Illinois	Fracture, foot	do	do
34 J. N.	111 Ohio	Left heel shot	None	do
35 F. H.	3 Kentucky	Compound fracture, left foot	Primary amputation, leg	Died of tetanus 12th day
36 T. D.	6 Missouri	Compound fracture, great toe	None	Died of typhoid symp. 11 day
37 J. B.	51 Ohio	Slight wound, left foot	do	
38 W. J.	16 Ohio	do ankle	do	
39 C. J.	do	do	do	Recovered early
40 D. McC.	do	Flesh wound, foot	do	Doing well 8th day
41 F. C.	do	do	do	do

*Addenda from notes of other Western Battles.*

42 A. V. L.	1st Ill. Art.	Comp. frac. of 1st 3 metatarsals, left foot	Chlor.	Recovered
43 J. K.	40 Illinois	do of os calcis and astragalus	None	do
44 J. S.	do	Flesh wound, left foot	Chlor.	do
45 M. L.	do	Foot crushed with cannon ball	Chlor.	do

To the above should be added 5 cases of trivial wounds, received in the fights near Vicksburg, which remained with their regiments. Total wounds of the foot, 50.

## METHOD OF DEDUCTIONS FROM THE ABOVE DATA.

These tables contain a condensed record of 730 wounds. By the arrangements before mentioned, I was able to follow the history of most of these patients for fifteen or twenty days, at the end of which time the question of life or death is usually settled.

In the following pages I shall assume, therefore, that those who at the end of that period seemed to be out of danger, have recovered. The deaths I enter as actually recorded; and the cases which remained critical, or were not heard from, will appear under the head of doubtful. A few errors may thus creep in, but they will not be sufficient to affect our general conclusions.

We will first consider the wounds in relation to the regions of the body affected, noticing the distribution, mortality, and modes of treatment of each species of injury, and subsequently show the conclusions to be drawn from the various surgical operations and their results.

The wounds were distributed through the body in the following proportions:—

Wounds of the Head, .....	50
do. Neck, .....	10
do. Trunk, (not including pelvis,) .....	164
do. Arm, .....	69
do. Elbow, .....	14
do. Fore-arm, .....	43
do. Hand, .....	77
do. Hip, .....	41
do. Thigh, .....	107
do. Knee, .....	25
do. Leg, .....	79
do. Foot, .....	50

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Total, ..... 730

*Injuries of the Head.*

I saw great numbers of these in different battles, of whom, I could obtain no record. My recorded cases are 50 in number,



which were distributed as follows: flesh wounds and contusions 30, fractures of the face 9, fractures of the cranium 5. The small number of fractures of the cranium results from the following causes: 1st, many wounded in the brain die on the spot, and never appear before the surgeon; 2d, the face lying in front of the cranium, often shields it; 3d, many bullets striking the cranium obliquely, glance off, merely plowing the scalp. Of these 5 fractures, 2 were from bullets penetrating the brain, and 3, from pieces of shell or oblique bullets. They all died without exception; only 1 was trepanned, and he, without benefit. The general result in military surgery is, that gun-shot fractures of the cranium are fatal, and that trepanning is very seldom useful. In penetrating wounds of the brain, the bullet drives before it numerous fragments of bone, hair, clothing, etc., which lodge in the cerebral substance, and occasion hopeless inflammation. A few unrecorded cases of recovery, however, came to my knowledge, and it is worthy of notice that these were, without exception, wounds of the anterior lobe of the brain, which, for some reason seems to sustain injury with less mortality than any other part.

Of the 9 fractures of the face, 5 recovered, 1 died, and 3 remained in a doubtful state. Bullet wounds in the bones of the face are somewhat prone to be followed by secondary hæmorrhage.

Of the 30 flesh wounds, 16 recovered, 4 died, and 10 remained doubtful. Of the entire 50 wounds of the head, of all kinds, 26 recovered, 10 died, and 14 remained uncertain.

#### *Wounds of the Neck.*

These were 10 in number, and were all flesh wounds; 6 recovered, and 4 remained in doubt. Wounds of the large vessels, and fractures of the cervical vertebræ, usually die on the field, at once, without coming to the notice of the surgeon.

#### *Wounds of the Trunk.*

Under this head I include the shoulder, but reserve the hips for a separate consideration; as thus considered, the wounds of the trunk were 164 in number; 36 penetrated the lungs, 10

pierced the cavity of the abdomen, 31 were flesh or fracture wounds of the shoulder, and 87 were flesh wounds of various regions, or fractures of ribs, not penetrating any cavity.

Of the 36 wounds of the lung, 12 recovered, 18 died, and 6 were uncertain.

Of the 10 wounds penetrating the cavity of the abdomen, 2 were stabs, and 8 gun-shot wounds. The stabbed cases both recovered; but of the 8 bullet-wounds, 6 died, and 2 remained in doubt. There was very little hope of them, however; and they should, probably, all be reckoned as dead. With very few exceptions, bullet wounds into the abdominal cavity are all fatal. It may be a question worthy of serious thought, in view of the hopelessness of our present practice, whether we ought not to cut boldly into the abdominal cavity, wash out the filth, and bringing the wounded intestine to the surface, endeavor to produce an artificial anus.

Of the wounds of the shoulder, 31 in number: 20 recovered, 2 died, and 11 remained in doubt.

The 87 superficial wounds of the trunk all recovered.

Of the total number of those wounded in the trunk and shoulder, 20 died, 142 recovered, and 2 were doubtful.

Wounds of the head, neck, and trunk, from their nature, seldom admit of much surgical assistance; taken as one class, they present a mortality of about 20 or 30 per cent; which may be somewhat diminished by good care, or horribly increased by bad air in a crowded hospital; but can be little affected by operative measures, except in a few instances.

### *Wounds of the Arm.*

The very opposite is true, however, of the wounds of the extremities; here the skill and sound judgment of the operator are of immense value, and the correctness or error of his measures will produce vast changes in the ratio between mortality and recovery.

Of wounds of the arm, my records show 69 cases, of which, 28 were compound fractures of the humerus, and 41 were flesh wounds. The flesh wounds all recovered; of the fractures, 21

recovered, 4 died, and 3 were in doubt. In 6 of the fractured cases, the shoulder-joint was resected; of which, 5 recovered, and 1 died. In 6 others, amputation was performed at the shoulder-joint; of which, 4 recovered, and 2 died. In 8 cases, amputation of the arm was performed; of which, 7 recovered, and 1 is unknown. In 8 cases, no operation was performed, and the fracture was treated with splints; of these, 7 recovered, and 1 died.

The ratio of mortality in all the gun-shot fractures of the humerus is 1 in 7. The question of the grounds of choice, between resections and amputations of the extremities, will be discussed below, under the head of operations.

#### *Wounds of the Elbow.*

Of these, 4 were flesh wounds, of which, 2 recovered, and 2 are unknown; 10 cases were compound fractures of the joint, of which, 7 recovered, 1 died, and 2 remained undecided. In 4 of the cases, resection of the joint was performed, of which, 3 recovered, and 1 died. In 3 cases, amputation of the arm was resorted to, of which, 2 recovered, and 1 was not decided. In 3 cases of less severity, no operation was performed, and all recovered.

The total number of wounded in the elbow was 14; of whom, 9 recovered, one died, and 4 remained doubtful.

#### *Wounds of the Fore-arm.*

Of these, 27 were flesh wounds, and 16 were compound fractures. Of the flesh wounds 22 recovered, and 5 were doubtful. Of the compound fractures, 10 recovered, and 6 remained in doubt.

In 4 of the cases, amputation was performed, and all of them recovered; no death, therefore, was observed from wounds of the fore-arm.

#### *Wounds of the Hand.*

Of these, 38 were flesh wounds, of which, 37 recovered, and 1 died; 25 cases were fractures of the phalanges, of which, 18 recovered, and 7 are unknown; 9 cases were fractures of the

metacarpals, of which, 4 recovered, and 5 are unknown; 5 cases were fractures of the wrist, of which, 3 recovered, and 2 are doubtful. 24 fingers were amputated, of which cases, 19 recovered, and 5 were not heard from. One amputation was performed through the metacarpals,—result unknown. One shot across the metacarpals, was very unjustifiably treated by amputation of the fore-arm four inches above the injury; the patient recovered.

Total wounds of the hand 77; known mortality 1.

#### *Wounds of the Pelvic Region.*

39 flesh wounds of this region occurred, of which, 30 recovered, 2 died, and 7 were undecided; 1 of the 2 cases which died, was wounded in the bladder, and the other perished of secondary hæmorrhage and general exhaustion, from the bad air of an overcrowded boat.

Only 2 cases of fracture of the pelvis were brought to my notice, both of which recovered; the viscera were not wounded in either. Total wounds of the pelvic region 41.

#### *Wounds of the Thigh.*

This is a most important division of the field of military surgery, and from it spring some of the most trying and difficult questions which are ever laid before the operator for decision. The discussion of these questions will be given below, under the head of operations.

The total number of wounds of the thigh was 107, of which, 89 were flesh wounds, and 18 were compound fractures. Of the 89 flesh wounds, 75 recovered, 3 died, and 11 were doubtful; of the 18 fractures, 5 recovered, 12 died, and 1 was doubtful; 5 of the fractured cases were amputated at the upper third, of which, 1 recovered, and 4 died; 3 were amputated at the middle third, of which, 2 recovered, and 1 died; 1 was amputated at the lower third, and recovered; 2 cases were treated by resecting the fractured portions in the continuity of the shaft, both of these died; 8 cases were treated without operative interference, by simply employing splints, position, and such incisions as were necessary to evacuate pus, of these, 2 recovered, and 6



died. The 2 which recovered were both shot in the cancellar tissue of the neck or trochanter, where my operation must necessarily have been amputation at the hip, or excision of the head of the bone; 1 of them lay twenty hours on the field, in very raw and cold weather. It would seem that shots through the cancellar tissue, at the superior fifth of the femur, are much less dangerous than those in the compact bone of the shaft below; the reason is, that when a ball bores its way through spongy bone, it produces only a moderate amount of shattering, owing to the yielding character of that tissue; but the impact of a minnie bullet upon the brittle ivory of the shaft, shatters it for several inches, and disperses the fragments with the force of an explosion among all the surrounding tissues, producing immense disorganization. These cases nearly all die within the first five days, no matter what treatment is adopted.

#### *Wounds of the Knee.*

There were 26 wounds of the region of the knee, of these, 14 were flesh wounds, and 12 were compound fractures; 12 of the flesh wounds recovered, none died, and 2 remained doubtful. Of the 12 compound fractures, 5 recovered, 4 died, and 3 remained doubtful; 10 of these fractures were treated by amputation at the lower third of the thigh, of which, 6 recovered, 3 died, and 1 remained in doubt; 1 case was treated by resection of the knee-joint, and recovered; 1 was treated without any operation, and died. In this connection, it may be remarked that I observed a considerable number of cases of gun-shot fractures of the knee at the battle of Shiloh, very injudiciously treated as ordinary fractures, without any operation; as I could obtain no record of the cases, I have not entered them in the tables, but I never knew one to recover. Let any young surgeon, who is reluctant to sacrifice the limb or joint in these cases, take the trouble to dissect two or three of them, and he will see at once why they all die, unless they are amputated or resected. The bullet disorganizes the interior of the joint in a most surprising manner, filling it with five hundred fragments of bone and cartilage and putting it in a condition from which no human frame can recover without operative help.

*Wounds of the Leg.*

These were 79 in number, of which, 56 were flesh wounds, and 23 were fractures. Of the 56 flesh wounds, 51 recovered, 1 died, and 4 were undecided; of the 23 cases of fracture, 14 recovered, 7 died, and 2 are unknown; 12 of the fractures were treated by amputation of the leg, of which, 11 recovered, and 1 died; 1 was treated by amputation of the lower third of the thigh, and recovered; in 1 case, a portion of the bone was resected, which also recovered; 8 cases were treated by splints, without any operation, of these, 2 recovered, 4 died, and 2 remained doubtful.

*Wounds of the Foot.*

These were 50 in number; 31 were flesh wounds, and all recovered; 4 were fractures of the phalanges, and all recovered; 6 were fractures of the metatarsus, of which cases, 4 recovered, 1 died, and 1 is unknown; 9 were fractures of the tarsus, of which, 7 recovered, 1 died, and 1 remained doubtful; amputation of the toes was performed in 4 cases, which all recovered. No amputation through the metatarsus occurred; one amputation through the tarsus was performed, and the patient recovered. In 4 cases the leg was amputated, of which, 3 recovered, and 1 died. A portion of the tarsus was resected in 1 case, which recovered.

*Predominance of wounds on the Right Side of the Body.*

In western warfare, the constant occurrence of battles in the forest, gives predominance to the operations of skirmishers, who deliver their fire usually from the right hand side of the trees that shelter them; in consequence of this, the right hand, arm, and shoulder, and the right thigh, knee, and leg, receive many more wounds than the left.

*Discussion of the Operations.*

The operations in these cases were, for the most part, executed by well educated and skilful men, so that there was little occasion to criticise them. In respect to the mode of their performance, they will compare favorably with similar operations in

any other army. There were some errors of judgment, respecting the kinds of treatment to be decided upon, but not more than was to be expected.

The following tables show the number and locality of the operations:—

*Amputations.*

	Recover'd.	Died.	Doubtful.	Total.
Amputations at the shoulder-joint,	4	2		6
do. of the arm,	9		2	11
do. do. fore-arm,	5			5
do. do. hand,	1			1
do. do. fingers,	19		5	24
do. do. thigh, upper third,	1	4		5
do. do. do. middle do.	2	2		4
do. do. do. lower do.	7	3	1	11
do. do. leg,	14	2		16
do. do. foot,	1			1
do. do. toes,	4			4
Total,	67	13	8	88

No case occurred in which we felt justified in amputating at the hip-joint.

*Resections.*

	Recover'd.	Died.	Doubtful.	Total.
Shoulder-joint,	5	1		6
Elbow-joint,	3	1		4
Parts of hand,	1		1	2
do. shaft of femur,		2		2
Knee-joint,	1			1
Parts of fibula,	1			1
do. foot,	1			1
Total,	12	4	1	17

*Ligations of Arteries.*

(Generally for secondary hæmorrhage.)

	Recover'd.	Died.	Total.
Sub-clavian artery,	1		1
Sub-scapular do.	1		1
Facial do.	1		1
Axillary do.		1	1
Profunda femoris artery,	1		1
Femoral artery,	2	1	3
Total,	6	2	8

In reviewing these tables, it is a matter of profound regret, that among some thousands of wounded, who, in different battles have been under the care of myself and others, we were able to trace out the results of so few cases; still, the careful observation of the facts here recorded, combined with statistics from other sources, will help to set at rest the most prominent of the disputed questions of military surgery.

The practical questions before the military operator, are mainly the following:—

1. What cases require amputation?
2. What cases require resection?
3. What cases should be treated without operative interference?
4. What variations from accepted rules must be made, in view of special military exigencies.

First then:—

*What cases require amputation?*—The rule is now well established, that the military surgeon may go almost all lengths in his efforts to preserve superior extremities; but that in the inferior, amputation must be very extensively practiced.

*Amputation of the shoulder-joint.*—This is only required in cases where an arm has been torn off by a cannon-shot, or otherwise so hopelessly disorganized as to render mortification of the whole limb inevitable. If the head of the humerus is shattered, resection should be preferred. In my experience, as shown in the above tables, amputations at the shoulder have had a mortality of one in three, while resections of the joint only showed a loss of one in six.

In the Schleswick, Holstein, campaign, ESMARCH gives the results of 19 resections of the shoulder, of which, 12 recovered, and 7 died. GUTHRIE quotes 44 cases of amputation at the shoulder-joint, in the British Wars with Napoleon, of which, 17 died. Combining all these statistics, we find the following results:—



	Total number.	Recover'd	Died.	Per cent of deaths.
Amputations at shoulder,	50	31	19	38
Resections of do.	25	17	8	32

Showing an advantage of 6 per cent in favor of resections.

In addition to the diminished risk, the great value of the preserved limb is to be taken into account. After resection, the use of the elbow and hand is perfect; and some soldiers have even returned to duty as soon as the cure was perfected. In case of doubt whether an arm can be saved, time should be taken to watch the progress of the patient before deciding, for, although primary operations are preferable, yet the secondary ones are very well borne; and it is a man's duty to risk his life to some degree, for so important a member as a superior extremity. GUTHRIE fully sanctions the same opinion, when he affirms that amputations of the superior extremity should not be primary, unless the impossibility of saving the limb is obvious.

Sabre cuts and bullet wounds, simply opening the shoulder-joint, without serious comminution of the bone, do not render either resection or amputation necessary, as the patient recovers with ankylosis, in the majority of instances. If, however, the head of the humerus is badly comminuted, an operation of some kind is absolutely required, as the mortality in cases treated simply with splints, is found to be over 60 per cent.

*Amputations of the arm.*—These should only be performed when there is no possibility of preserving the limb. Amputations for bad fractures of the humerus, or for shattered elbows, while there is still a good pulse at the wrist, are no longer justified by any respectable authority. It is often astonishing to inexperienced surgeons to see from what terrific injuries a wounded arm will recover itself. If the bone is shattered, the artery cut, and the anastomotic vessels also so extensively destroyed, that circulation in the limb ceases, amputation should be immediately resorted to. If, however, circulation continues in some measure below the injury, the loose fragments of bone should be picked out, and the limb dressed as for other compound fractures.

The mortality after amputations of the arm is but slight; of 11 cases in my tables, not one died. Of 72 cases mentioned by GUTHRIE, only 17 died. Combining these statistics, we have the following result:—

	Total number.	Recover'd.	Died.	Per cent of deaths.
Amputations of the arm,	83	66	17	20½

*Amputations in the fore-arm and hand.*—As we recede from the body, both operations and injuries become less fatal. All the cases of amputation of the fore-arm and hand, of which I could obtain the results, recovered. The few who die, succumb not to the operation, but to the secondary effects of the deadly air of overcrowded hospitals. In every case where required, the amputation may be resorted to without fear; but it should be borne in mind that the fore-arm and hand recover from the most frightful looking wounds with surprising ease, and that every inch which can be preserved is of priceless value to the patient. In a mangled hand, almost every part which is not torn off, may be preserved, and should be, generally, retained. I make these remarks, because I have observed that inexperienced surgeons will often be moved by the ghastly appearance of a fractured and lacerated hand, to undertake very unjustifiable amputations.

*Amputations at the hip-joint.*—No case of this fell under my notice, as we all adopted the principle, that it was an operation which can scarcely ever be justified.

*Amputations of the thigh.*—In this part of the body, we reverse the rules applied to the superior extremity. Instead of going all lengths to save the member, we incline more decidedly to prompt and resolute amputation on the field. Secondary amputations of the thigh are usually fatal, therefore, the decision of the surgeon must be made up on the spot, from the appearance of the case, and resolutely carried out. My records show 20 amputations of the thigh, of which, 9 died, 10 recovered, and 1 remained doubtful, being a mortality of about 45 per cent. It is of the utmost importance here to observe the difference of mortality between the upper and lower parts of the thigh,

because, on this difference are based life and death decisions. The following table illustrates it:—

	Total cases.	Recover'd.	Died.	Doubtful.	Per cent of deaths.
Amputated upper 3d of thigh,	5	1	4		80
do. middle do.	4	2	2		50
do. lower do.	11	7	3	1	27

Showing plainly that “every inch by which this operation approaches the body, increases its danger.”

According to LONGMORE'S statistics, a similar percentage was observable in the Crimean Campaign, as is shown by the following table:—

	Per cent of deaths.
Amputation, upper third, in Crimean War, . . . . .	87
do. middle do. do. . . . .	60
do. lower do. do. . . . .	57

These figures show a more favorable result in our army than in the British, by an average of about 20 per cent. Combining the two tables, we have approximately the following:—

	Per cent of deaths.
Mortality of amputation at upper third, . . . . .	83½
do. do. middle do. . . . .	55
do. do. lower do. . . . .	42

The obvious deduction of which, is that the amputation should be made as far from the body as the nature of the injury will possibly permit. Such being the frightful mortality of amputations of the thigh, I tried in two cases to produce a better result, by resecting the ragged ends of the broken femur, and then treating it as for compound fracture. Both these cases died within the fifth day. The same experiment was tried on the Potomac, by Eastern surgeons, and also in the Crimea, and always with the same result,—every case proving fatal.

Still, other experiments have been made, by treating the case simply as a fracture, without any other operation than an incision to evacuate the pus. STROMEYER quotes 4 cases of recovery. My tables show 8 cases treated in this manner, of which, 2 recovered, and 6 died. These cases were mostly fractures above the middle; hence the mortality of 75 per cent

is not greater than would have followed amputation in the same place. In Europe, after the battle of Toulouse, this mode was tried on 43 of the most favorable cases, with a mortality of about 60 per cent, which, on the whole, is not much worse than the results of amputation, which, in nearly all fractures of the femur, must be as high as the middle, and has a mortality of 55 per cent.

A careful, and very deliberate examination of this whole matter, has settled in my mind the following conclusions:—

1st.—A very large portion of the cases with badly comminuted femurs, will die within five days,—under all treatments, alike. There is no perfect reaction.

2d.—Shots through the spongy tissue of the trochanter and neck of the femur, are less fatal than those through the compact tissue of the shaft. This is contrary to STROMEYER's opinion; but it is nevertheless true. The splintering of the bone, and consequent injury of soft parts, is far less in this spongy part than in the ivory-like shaft below. These cases of fractured neck, require neither amputation nor resection of the head of the femur; a large part of them will recover with simple extension-splints, and in some cases, incisions to evacuate pus; whereas, amputations and military excisions at the hip-joint may be practically said to be all fatal. I know of 2 cases of this fracture which recovered without difficulty in straight splints.

3d.—Amputations above the middle of the femur should only be resorted to in desperate circumstances, where the limb below is either torn off, or is so injured that it has but little prospect of escaping mortification. If the circulation and innervation are good below, a free incision should be made down to the comminuted bone, and the limb be dressed with a straight splint and adhesive-strap extension-bands. The case is a desperate one, but I am confident that this treatment will save more lives than amputation above the middle.

4th.—If amputation can be made below the middle of the thigh, it should be promptly performed, for all severe compound fractures of the lower half of the shaft of the femur, and all gun-shot fractures of the knee-joint. By this treatment, about

75 per cent of the patients may be saved; but if attempts are made to save the limb, almost every man will die. At the battle of Shiloh, a large number of cases were treated with this false conservatism, and many lives sacrificed in consequence. If any young surgeon feels reluctant to sacrifice a fair and plump thigh, for a mere little bullet hole of very harmless appearance in the knee, I advise him first to amputate, and afterwards to dissect the limb; he will find within the joint a horrible disorganization, such as no man can reasonably hope to survive, without operative assistance.

*Amputations of the Leg.*—These may be resorted to whenever a useful limb cannot be preserved, as the operation is not excessively dangerous. If, however, the circulation in the foot continues, and a chance of future usefulness of the member presents itself, conservative surgery should be practiced; because the danger of postponing or omitting amputation is not great, even though the foot should mortify. One hint may serve to guard young surgeons against a natural error: when a bullet traverses through the tibia from before, backwards, the front opening in the skin is small; but the fragments of the bone are driven back among the tissues of the calf, producing more danger of mortification than the first glance indicates. On the other hand, if the ball has traversed from behind, forwards, it drives all the splinters outward through the skin in front, doing less real injury than in the former case, but still tearing open the skin, and everting the flesh over an area of two or three inches in diameter. The wound looks so hideous, that it is not uncommon for the inexperienced operator to be moved by it to cut off the better limb and save the worse.

*Amputations of the foot.*—These may be decided upon and executed by the same rules as in civil surgery.

### *Resections.*

*Resection of the shoulder-joint.*—The grounds of choice between this and amputation have already been discussed under the head of "Amputations at the shoulder." It is to be preferred, in proper cases, both for its superior safety, and because it saves a most important limb.



*Resection of the elbow.*—My tables show 4 cases of this resection, of which, 3 recovered, and 1 died. ESMARCH quotes 40 cases, of which, 6 died. Combining the two sets, we have this table:—

	Number of cases.	Recover'd.	Died.	Per cent of deaths.
Resection of elbow-joint,	44	37	7	16
Amputation of arm,	83	66	17	20½

Showing an apparent advantage of  $4\frac{1}{2}$  per cent in favor of resection. As amputation, however, was often for severer injuries than those which required resection, it will, probably, be fair to assume that in injuries which admit of the choice, the risks of the two operations are about equal; but as resection preserves, and amputation loses the hand, the choice is unquestionably for the former. I, therefore, advise resection for all comminuted gun-shot fractures of the elbow-joint, in which the preservation of the hand is not hopeless from gangrene.

*Resections of parts of the hand.*—These should be governed by the same rules as in civil practice.

*Resections of the knee-joint.*—The great mortality of amputations of the thigh, has caused this operation to be proposed as a substitute in cases of bullet wounds of the knee. My tables show only one case, and that recovered. From all sources, European and American, I am able to collect accounts of only 8 cases in military practice, of which, 2 recovered, and 6 died; a mortality of 66 per cent, which is 24 per cent worse than that of amputations at the lower third of the thigh. More extensive statistics, however, are needed to settle its true value. At present I advise, both from my own observations and careful review of the opinions of other surgeons, that in case good air, and freedom from motion can be had for the patient, resection of the knee may be preferred; but, if he must be transported far in an ambulance, or put in a crowded hospital, where there is less than 1200 cubic feet of fresh air for each patient, resection will prove fatal. Amputation should then be at once performed, for delay with a view to secondary resection is not to be thought of.

*Resections in the leg and foot.*—These are well-borne, and follow the same rules as in civil practice.

*Anesthetics.*

Chloroform was freely used in most of the painful operations. A mixture of chloroform and ether was used in one case. Ether alone was not used, to my knowledge, in any case. Chloroform was administered in 113 cases, without any accident.

*Diseases of overcrowded Hospitals.*

There is a class of deadly complications following the injuries of patients after nearly every large battle, which, are almost solely the product of overcrowding and bad air. These are the following:—

Erysipelas,

Pyæmia,

Diffusive phlebitis,

Hospital gangrene.

About 10 or 15 per cent of the deaths in military surgery are from these causes, and I regret to say, that in many instances these dead are slain by the surgeon, whose stupid ingenuity was all expended in procuring beds in warm and close quarters, where the patients poison each others' blood, instead of having free air where they may breathe and live.

After the battles at Vicksburg, the wounded were put upon three steamboats; but by accident were not evenly distributed. It thus happened that the small steamer "Von Phul" received over 300 cases, while the large boat "City of Memphis" had only 120. This arrangement, owing to military movements, could not be changed under about ten days; the results were disastrous,—but yet instructive. About the fifth day, I was ordered to take command of the "Von Phul." Going on board, I found about half the patients crowded into the cabins and state-rooms, where they had, by measurement, only 250 cubic feet of air per man, when they should have had not less than 1200 feet each. The windows and doors were mostly closed, and an overpowering stench of putrifying pus pervaded everything. Erysipelas and pyæmia had already commenced; and secondary hæmorrhage and gangrene were quite common. The patients were rapidly dying, and every wound, without exception, presented a bad, unhealthy aspect. Meanwhile, the rest



of the patients who occupied the open decks, outside, were doing well. Almost every death was in the cabin. I immediately opened all the windows and doors, and ordered a large portion of the wounded to be carried out and laid upon the decks. In this way, the evil was mitigated, but much mischief was already done. By the tenth day, we had lost 45 patients, or one-eighth of the entire number. Meanwhile, the "City of Memphis," with her small numbers, and vast airy cabins, had only lost 1 patient in 20. On the tenth day, the military commanders committed the enormous blunder of ordering all the wounded of the three boats to be concentrated upon the "City of Memphis." This, however, being the largest boat in the fleet, did not prove so bad as might have been feared; but it was a most unwise arrangement, and would have cost some further lives, but for the great care exercised over ventilation, by Dr. TURNER and his assistant, Dr. WITT.

I have observed with pain, that partly by military necessity, and partly by ignorance of ventilation displayed by surgeons, this error of overcrowding is repeated after almost every large battle, and perpetuated in most of our large General Hospitals.

If the weather is not so inclement as to endanger death from cold, I have no doubt that by far the best plan is to keep the patients dispersed for two or three weeks in open tents and booths in the field; although, in this way they have less comfortable beds, and coarser food than in Post Hospitals, they get fresh air, and with that they often survive the most desperate wounds.

It is often remarked, that men wounded in occasional skirmishes, where they are kept with the Regimental Hospital in the field, seldom have erysipelas or pyæmia, and recover from their injuries far more readily than those sent away to large, square, six story buildings, like the Overton Hospital in Memphis, where overcrowding is frequently unavoidable, and perfect ventilation an impossibility.

The results of my observations in the army, under this head, may be summed up, therefore, in one sentence:—Let the military surgeon see that he gets fresh air for his men in preference to food, warmth, or shelter.

Men will lie in snow, on wet ground, or under open sheds, and do well on bacon and hard bread; but, in close hospitals they will die, though they have all the luxuries of the world around them.



